BY JOHN WALSH

good golf courses are for communities.

BRYANT: The challenge we face is the one we've faced for many years, but it's getting to be a serious problem. It's the availability of water and water quality, particularly in the western part of the U.S., but that's been expanded to all parts of the country. Water quality has continued to decrease, and that affects us two ways. One, if water quality decreases, it affects agronomics and the equipment because it doesn't last as long. Second, it increases the cost of the systems we design because, when trying to minimize waste, it requires more sophisticated irrigation systems. We're constantly balancing having too many bells and whistles yet having adequate technology in place to control water.

CAVERLY: Another key is the development of useful technologies and tools to take ocean water, brackish water and poor-quality well water, and treat it to make it useful from an agronomic standpoint so it's good for the turf.

BRYANT: It's a challenge that faces all parts of the industry. It affects the contractor and its bidding. It affects the agronomics, not only initially but long-term. It affects the research and development that's being done on turfgrasses and how these turfgrasses are maintained.

GCI: At this point, is it a crisis, or do you see it becoming one during the next few years? Do you

Clockwise, from top left: Glenn Caverly, Klaus Ahlers, Willie Slingerland, Wayne Massey, Oscar Rodriguez and Bob Bryant discuss how water quality impacts the cost of building golf courses. Photos: John Walsh

sense the industry is adapting to this problem?

BRYANT: It's a crisis in some parts of the country simply because some golf courses can't move forward because they can't get a permit to have a reliable water source. In some parts of the world, they start building a golf course without having permits in place to have a water source. China is a prime example of that, Mexico to a certain degree and even in the U.S. We've been involved in projects in which developers weren't quite in place with their water source and struggled with the project because of that.

RODRIGUEZ: It's also affecting the standards in golf course construction. As we migrate to the Dominican Republic, for example, they're using paspalum grasses that are more tolerant to salt water. But you don't get the quality of USGA construction on greens. It has a counter effect. The USGA standards for greens construction no longer apply. The water availability isn't there. Without paspalum grasses, we couldn't build some golf courses that are being built today.

GCI: Is the USGA is willing to change its specs because of water quality?

RODRIGUEZ: I don't think they're going to change them, but when you're looking at it worldwide, you have to make some concessions.

CAVERLY: You have to make adjustments from region to region based on water, and in many cases, the availability of materials you have to use in construction to begin with.

BRYANT: What we're having to do because of water quality is continue the soil profile that we've created. We can fan the profile we've used in greens into the fairway and, in some cases, into the rough just to have a surface in which we can control percolation rates because even with paspalum, the less uniform the water distribution, the higher the salts come up. There's been a lot of talk about salt intrusion and salt-affected turfgrass. It's back to irrigation systems again. We've been forced to move sprinklers closer and closer to maintain higher distribution uniformity to push salts down.

RODRIGUEZ: It goes back to getting paid projects off the ground. We started budgeting golf courses and throwing out current irrigation budget numbers. We need to sit back and rethink if it makes sense or not to have that project.

CAVERLY: What we're finding frequently on the construction side is that owners are projecting budget numbers based on other courses that have been built. And when all this stuff comes up, that's where we all get in a pickle because when the true numbers come out, we're four or five million dollars short. It's almost like the consultants don't do enough homework up front to let the owners know what a true dollar budget is that they need to deal with.

Every job's different, every piece of property is different. It's county to county, city to city anymore. There are different soil and water properties that need to be dealt with. So there's a lot more research that needs to go into preplanning and prebudgeting a golf course today.

SLINGERLAND: When you're dealing with these higher salt contents, you're not using standard equipment anymore. You're using pumping systems that are completely made out of 3/16 stainless steel, which is three times the cost of a regular station. You have to use special fittings just to handle the high salt content or the acidic water, whatever it might be. Even the sprinkler heads have steel springs and 3/16 instead of 304 plungers. All of these things continue to add to the cost. You don't see them in most cases, but they keep adding up. If you do a job in the Dominican versus a job in central Texas, it's not even remotely in the same price range.

AHLERS: We're changing over from standard iron to almost everything being epoxy coated. We

"We're changing over from standard iron to almost everything being epoxy coated. We started it because of water conditions ..."
- KLAUS AHLERS

started it because of water conditions and fertigation injection, acid injection, things of that nature. We changed all the internals to stainless steel. You can't look at this and say they've got good water and everything's all right and not think that in the future if the quality of reclaimed water deteriorates everything will fall apart.

BRYANT: Remember it's not just water. It's a combination of water and soil. Both of those have to be analyzed for what the total effect of that profile will be when you apply certain water to a certain soil.

AHLERS: In some cases, the soil conditions are as bad as the water conditions for salinity. It's easier to epoxy in and out, otherwise you're going to tape it off and separate it. In some places it has been done that way. The stuff we shipped years ago to Saudi Arabia was like that, and Hawaii has always been that way because of the soil conditions.

GCI: What are some challenges with regard to budgeting?

CAVERLY: The GCBAA has a cost guide for estimating construction, and it's broken up in different regions of the country. It's based more on true numbers not guess numbers, so we have that available today, which is a lot closer than somebody shooting from the hip.

BRYANT: Those are guidelines. But the owner needs to understand the unique conditions of the property. They also need to understand the architect's vision for the project because a golf course that's routed one way in terms of irrigation and drainage can cost a certain amount of money. For irrigation, one linear project can add 20 percent more mainline pipe to get from one place to another if it's a long, linear housing site. Those are the things owners don't always realize. The individual aspects of the project need to be understood in terms of water, soil design and everything else. And quite often, the owner already has a budget before he has hired an irrigation designer. There are still owners who believe in a certain number because they've heard that number kicked around forever.

GCI: Are architects setting the owners straight in terms of cost?

AHLERS: There was case in North Carolina recently in which there were several architects who didn't see any value in the irrigation. A good, well-known irrigation consultant, who was actually brought in by the architect to begin with, made a presentation to the board. Everything looked fine with the budgets. Then the architect comes back in and says, "That's ridiculous. You don't need all this stuff. There's way too much stuff on this system that you don't need. We can put in more bunkers and tees or do something worthwhile." The attitude is that the efficiency of the system and water savings and stuff like that is just too much.

SLINGERLAND: You can have the greatest architect in the world, the greatest piece of property, but if you don't have water and a good distribution system to put that water on that turf, I might as well design the golf course. It comes down to the irrigation and the quality of the facility you're going to end up having.

BRYANT: The good news is that during the past 20 or 30 years architects have come to understand what the irrigation costs are and are more realistic about them, especially from those who understand agronomy. There are architects who understand design and have a vision, and there are those who not only have that but also have an agronomic understanding or a staff that has an agronomic understanding of running the course. Those that have that also realize the costs that are involved, and it's the age-old story that you have to spend the money on the irrigation and drainage upfront because that gives you the long-term value on the project. Otherwise, you end up with golf courses that have had to add an additional million dollars worth of drainage, and that's a shame when that happens. That's not always the architect's fault. Sometimes the architect tells the owner, and the owner isn't always willing to spend the money.

GCI: Are the builders and contractors brought in early enough in the development process?

RODRIGUEZ: It's a disservice if the architects don't educate their clients on the budget side. Many of these architects have their preferred contractor. But I don't remember ever having an architect call saying, "Hey Oscar, there's no commitments here, but I have a project. What do you think?" Most contractors would be happy to say, "Yeah we'll do that." If they want us to sign on the dotted line about it, that's a different story.

GCI: You can catch red flags early on, right?

RODRIGUEZ: Sure. Recently, we were bidding on a project in Northern California. I went to the site, and they were turning over the topsoil right into everything. I called this person and said 'Hey, I just want you to know I'm not going through a proper RFI because this is what I see. This soil is what you want on top. You've got to strip this.' He says, 'That's a budget cut. All these prices – PVC, copper – have gone up so we've got to find a way to cut cost.' I said 'You're making a lifetime decision about this golf course.' I'm not blaming the consultant because maybe the architect told him that. He was making a budget decision. Maybe he was stuck with that budget.

The architect should make a better attempt to contact builders and say, 'Hey guys, just give me your budget for this so we know if we're in the ballpark.' I do that on irrigation systems. I'll call Bryant Taylor Gordon or Marvin Mills and say 'Hey guys, give me a ballpark figure?' so I don't go in with a budget and do what I'm complaining about with other architects.

MASSEY: I don't know of any builder who won't offer those services a year and a half to two years in advance and give these guys ballpark numbers, some real numbers.

BRYANT: The most successful projects we've been involved in have been when we're part of a team, whether that was just the architect and us and the number of builders that were being considered. Usually, when you have that team together and the agronomist, you have the opportunity to establish a budget, evaluate it and then choose what things are worth considering, cutting or saving here and there and what things are detrimental to the project long term.

GCI: What areas can you cut that won't negatively affect the project long-term?

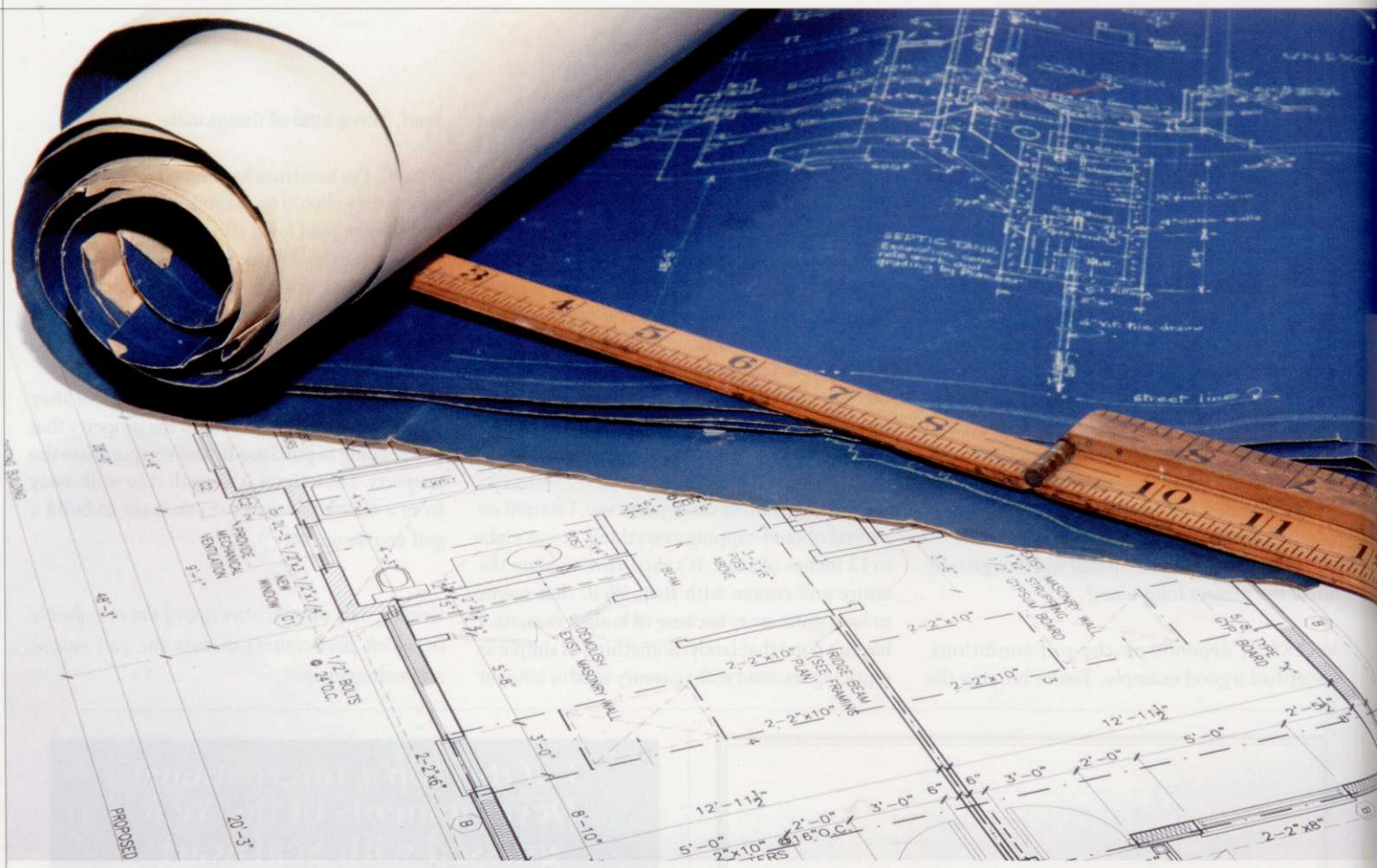
AHLERS: It depends on the soil conditions. Oscar had a good example. You're burying the topsoil underneath. Just moving dirt without considering what it costs you to stockpile it and put it back to what your long-term costs are is ridiculous. But somebody's got to hear that and understand the situation. When I was still doing construction, it was ridiculous to see these guys with the attitude of 'I'm not even going to be around here for this long-term thing. I want my $100,000 premium lots around this golf course. I'm not going to maintain it. I'm not going to take care of this thing later.' And then they wonder why nobody's playing the golf course and why members are leaving.

RODRIGUEZ: Two or three years ago, I started on a trend of sand-capping everything. It was eight to 12 inches of sand. It's expensive to plate the entire golf course with that. Well, that seems to have gone away because of budget reasons. I haven't done that lately. Something as simple as repricing tee sand with masonry sand or straight sand. Those kind of things make sense.

BRYANT: I've been involved in a couple of projects where they should have sandcapped and didn't, and they've paid for it 10 years later. An option is to sandcap, and if that option is too expensive, then another option is to consider stripping the topsoil and screening on site. Again, it's so specific.

CAVERLY: It's almost to the point where they need to take consultants out to the property that you're going to purchase before you purchase the property. Sometimes it's worth it to walk away from a chunk of land that you want to build a golf course on. **GCI**

Coming next month: Part two of the roundtable in which participants discuss the golf course renovation market.



a grand plan

There's much to consider when designing an ideal maintenance facility

Maintenance facility design should attempt to accomplish three primary objectives: provide a safe environment for workers, allow for optimal efficiency and reduce risks to the immediate environment. Photo copyright: Branko Miokovic (istockphoto)

BY MICHAEL VOGT

The challenge for golf facility operators is to deliver a high-quality golf experience continuously and manage costs effectively. Delivering a quality golf experience ensures a golf operation retains its loyal customers and supports maintaining a positive revenue stream.

However, operators don't always consider golf course conditions as a competitive necessity and don't plan the facilities that support golf course conditions, specifically the maintenance facility or turf-care center.

Operators can expect to spend $35,000 to $78,000 per hole maintaining a golf course. These figures include payroll, supplies, employee taxes and benefits. Additionally, facilities have made significant investments in maintenance equipment. Many clubs have more than a million dollars worth of equipment and related maintenance items needed for a smooth operation.

DECISION MAKING

With all golf facilities, the first priority is the golf course. The second priority are those areas highly noticeable to a club's membership or the public, such as the clubhouse. The golf maintenance facility is overlooked often. However, it's imperative leadership reach consensus that something needs to be done.

A method facilities can employ is the use of a strategic/business plan, which would identify issues and clarify goals. A plan establishes a timeline when the issue should be studied and a recommended solution proposed. Then a person or group is assigned ownership of the task. When a business creates a written record, it's usually followed and most issues can be addressed before they become major problems.

The task of analyzing and studying the maintenance facility normally is assigned to a planning committee, green committee or ad hoc golf planning committee. The task of reviewing the maintenance facility occurs in conjunction with a golf course improvement project. Ideally, this committee is composed of past and present members of the green committee and the board of directors, who represent every segment of a club's membership. For technical expertise, the committee also might include the golf course superintendent.

The committee also should include the appropriate specialists such as a golf course architect and an environmental specialist. For those committees assigned the task of analyzing the maintenance facility, the participants within this group will change.

The committee's initial tasks are to study the condition of the existing maintenance facility to determine the scope of work needed in a master plan. From here, an improvement plan for the maintenance facility can be developed with prioritized issues. Then the committee can develop probable cost estimates, which include construction costs and contingency amounts such as cost overruns and an estimate of the financial impact on the golf operation.

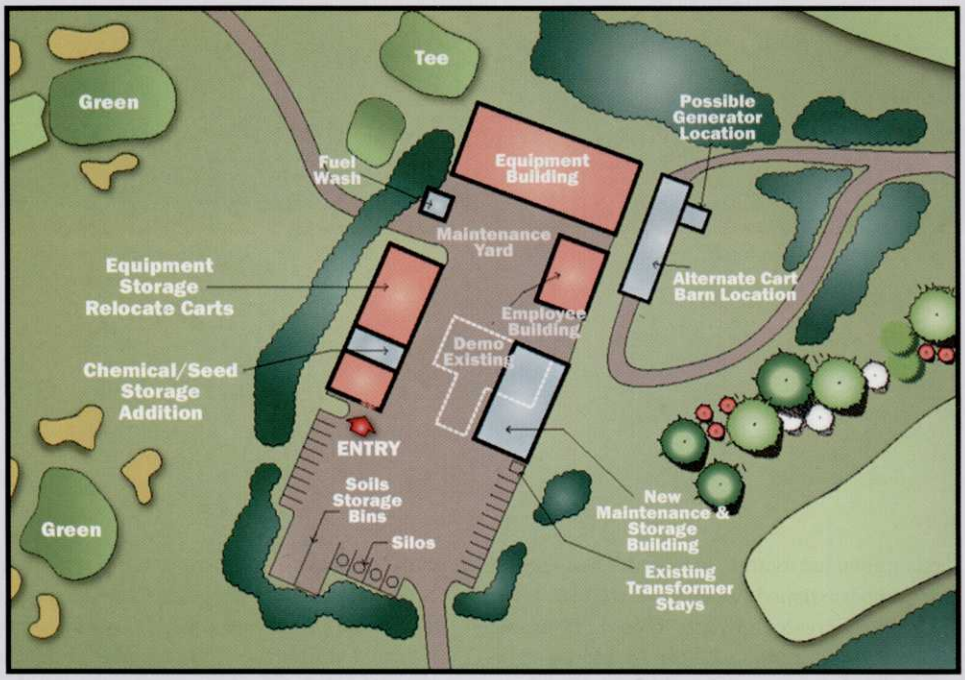
The committee also is responsible for communicating with the membership and other parties interested in the project's development. In a private club environment, space should be dedicated within the club's newsletter for the chairman of the planning committee or other officer to provide project updates. For municipal and daily-fee operations, the manager/owner is the primary decision-maker regarding the project, consequently consensus is achieved more easily. Within this streamlined environment, it's helpful to have experienced individuals available to assist with the plan's development.

A FINANCING PLAN

With a private club, developing financial options is the most critical success factor in cultivating membership support and approval for capital projects. The most preferred methods of funding a capital improvement are:

Monthly capital dues increase. A club uses a capital dues increase to finance a loan. The advantage of this is that most members prefer a low monthly payment in lieu of a large one-time payment. A member is excused from future payments if he leaves the club. The disadvantage of this financing method is that a loan will put a club in debt, and future member resignations could threaten a club's finances.

Nonrefundable assessments. The total project cost is divided equally among all golfing members and paid immediately. The advantage of this is that the project is immediately paid for. The disadvantage is it's the most unpopular method of securing funds with a membership



An example of a maintenance facility within the interior of a golf course. Photo: McMahon Group

because the high initial cost, and it forces the current membership to pay most of the cost.

Refundable assessment. The upfront assessment can be made more marketable to a membership if the club provides a refundable feature that becomes effective if a member leaves the club. It's recommended the refundable amount be depreciated during the life of the project. Experience shows the depreciation feature has little impact on gaining member approval for the project, but it will support the club's future financial profile.

Cash flow from operations. At times, facilities will set aside a portion of their revenue in a capital reserve fund that's been created for improvement projects. For private clubs, initiation fees or funds generated from a monthly capital fee is normally the source of this revenue. For others, a percentage of green fee revenue might be set aside to fund capital projects. Ideally, operating surpluses would be used to finance golf projects.

The important point is for the owner/operators to monitor their cash flow from operations carefully. The primary revenue source for municipal golf operations is tax revenue. As with private clubs, it's important for a municipal operation to explain the benefits to the taxpayers of the community clearly.

FACILITY DESIGN AND CRITERIA

It might be necessary to use a third party to review the existing facility, provide recommendations and prepare communications for a project related to the maintenance facility. One type of service includes visiting a maintenance facility, reviewing the site and floor plans, conducting a needs analysis, reviewing the maintenance schedule and staffing levels, then comparing the facility to the strategic goals of the course. Along with this analysis, a report can be generated to include an architectural solution and an opinion of probable cost, an outline of specifications and how to proceed with improvements. This process will identify the facility's shortcomings and propose a solution.

Another type of service is less expensive but still requires a site visit. It includes reviewing the golf course, staffing, maintenance facility site and building floor plans; conducting a needs analysis; and providing a recommendation based on a review of the site and floor plans of the maintenance facility.

Maintenance facility design should attempt to accomplish three objectives. One, provide a safe environment for the employees of the club and golf course. Two, allow for optimal efficiency by the maintenance staff. Three, reduce the risks to the immediate environment. Improper handling and disposal methods at a maintenance facility can create serious environmental problems and potentially expose members and owners to legal liabilities.

It's essential the facility is well conceived and organized, otherwise a club could be living with a maintenance facility that's wasteful, fails to address the needs of the operation and exposes the club to legal liabilities, which could include penalties and fines.

DETERMINING THE SITE

Consider a few planning issues when selecting a site for the maintenance facility. For new and existing courses, site identification is important to the design and efficiency of the facility. While some courses will attempt to centrally locate a maintenance facility within the course (see photo at right), other clubs don't have this option. Consequently, the location of the maintenance facility is on the border of a club's property, sometimes next to a residential area. Regardless of the location, the site should have enough space to allow for ample traffic circulation. When deciding on a location, several key questions should be answered:

- Does the site provide enough space for buildings the size you want?
- Are there utilities nearby?
- Is there space on the site for fuel storage and dispensing?
- Are natural water sources nearby?
- Is there sufficient space for chemical and fertilizer storage and equipment wash areas?
- Is there sufficient space to allow for the primary structure, ancillary buildings, the delivery of supplies, storage bins and waste-gathering areas?
- Is there enough space to provide employee parking?
- Is there enough space for a loading dock and forklift?
- What are the anticipated reactions from neighbors?

It's equally important to know if the site being considered is on a floodplain and is suitable for construction. At times, this critical piece of information is overlooked and causes problems when it's time to secure building permits.

Also, determine if the area is concealed from the golf course. This is usually a consideration when the quality aspects of the operation are reviewed. Whether or not the initial site analysis is favorable, it's advisable to have a secondary location in mind in case an unforeseen circumstance eliminates the first choice.

For maintenance facilities that care for more than 18 holes, the floor space for each key area should increase 50 percent with the exception of the administrative office spaces.

BUILDING, SITE REQUIREMENTS

A few planning guidelines should be considered when designing and building a maintenance facility. A total of 10,000 to 13,000 square feet should be allocated for the main structure. Administrative space, primary equipment storage, the mechanics area and possibly an irrigation storage room would be included within the primary structure. The chemical and fertilizer storage building should be separate from the main building. Construction materials should be chosen based on local and federal codes. When reviewing the operation of the site, it's critical all government requirements are verified to ensure code compliance.

Other planning characteristics:

- The outside area should be paved to support the delivery of equipment and supplies by large trucks. A paved area allows for easy pickup of waste.
- Fuel storage areas should be above ground.
- Outdoor covered storage bins should be used for sand and soil.
- A greenhouse should be included if it's feasible.
- Waste and Dumpster areas should be included. Consider excavating and paving a bay that puts the top of the Dumpster at ground level.

PRIMARY MAINTENANCE FACILITY

The primary maintenance facility structure should include the following:

Administrative space. This area handles the communication of the daily work priorities. The location should be as far away from the equipment storage area as possible. Maintenance logs, invoices and other records must be maintained daily, and a quiet workspace ensures accuracy. Storage should be provided for the maintenance department's records and supplies. A fireproof cabinet should be used to store material safety data sheets, spray application records, backup irrigation programs and inventory documents – all of which should be duplicated and stored off site.

Climate control is a requirement of this area as well. Computers are used for record-keeping, updating the superintendent's maintenance procedures and running an irrigation system. Climate control will help computers operate efficiently. If the club's maintenance and invoice records are stored on a computer in this area, the superintendent should consider having this information backed up daily. A third-party provider might be considered as a resource to back up important records.

Other key characteristics include:

- 1,500 to 2,500 square feet allocated to administrative/break room areas, record storage, etc.;
- Private office space for the superintendent, assistant superintendent, horticulturist, irrigation technician and mechanic and a conference room area;
- A break room or conference room;
- Men's and women's locker rooms;
- A guest restroom for club members or visitors; and
- A drying/mudroom to hang and store damp clothes.

The goal of the administrative area is to provide an efficient workspace that promotes communication of daily requirements.

Equipment storage. For most, 6,000 to 8,500 square feet should be allocated to maintenance equipment storage. Floors should be marked so each piece of equipment has a designated space. There should be a small, secure equipment storage area for handheld equipment such as trimmers, chain saws, etc. And there should be optimum circulation so equipment can be driven through, eliminating the need to back up into a space.

Mechanics repair area/parts storage. Most equipment repair areas are 1,500 to 2,000 square

feet and are connected to the equipment storage area and the parts storage room. Space should be designated for equipment that's scheduled for repair. This area should be equipped with a hydraulic lift that positions the equipment for quick repairs and adjustments.

Parts storage in most golf maintenance facilities average 200 to 250 square feet and should be used to store the most frequently used repair items. Some clubs will secure this area with a locked door so the mechanic and superintendent are the only personnel that have access to it. Regardless of access, there should be a direct entry into the equipment repair area so the technicians working on the equipment don't have to waste time retrieving parts.

Other considerations include an identified area for equipment in repair, an overhead rail system and forced air – with thermostat control – for heat in Northern climates.

Compressor rooms. A separate compressor building is acceptable for Southern climates, but a compressor should be located inside the primary structure in Northern climates. Compressor noise can be distracting to the players on the course and to the neighborhood. A separate compressor room should be provided within the equipment storage area or main repair shop with ventilation and sound insulation.

Grinding room. The grinding room in the main structure of the maintenance facility should be located adjacent to the mechanic's repair area. It should range in size from 200 to 300 square feet and should support rotary, reel and bed knife grinding. An adequate ventilation system – one that controls the filings – should be available.

Other considerations. Depending on the size of the maintenance facility's primary structure, other rooms can be introduced. Many operations have added irrigation storage rooms, oil and lubrication storage rooms and equipment tool set-up rooms.

CHEMICAL AND FERTILIZER STORAGE

Chemical storage. One of the most important features of a maintenance facility is the chemical storage building. A maintenance facility should use a separate structure that meets local environmental and safety requirements. The most obvious benefit of a separate facility is safety. If chemicals aren't stored properly, they could end up in high-traffic areas where the original container could be ruptured.

Another benefit of a chemical storage facility is the ability to contain spills and minimize a club's exposure to the immediate environment. A dedicated space also promotes an accurate inventory, reducing waste, theft and business order duplication.

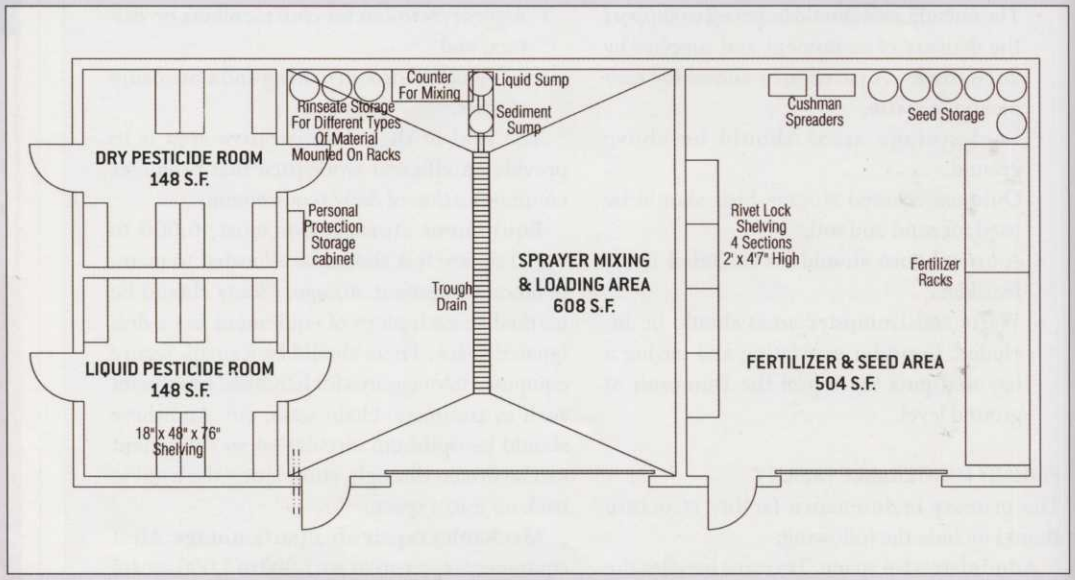
Other characteristics include:

- Being located at least 50 feet away from other structures on the site to allow for emergency access and 500 feet away from natural water sources;
- Averaging 400 to 500 square feet – more space is required if a mix/load area is incorporated in the design;
- An all-steel or sealed masonry construction (noncombustible materials);
- Shelving that's chromed, coated or painted metal or plastic;
- All light switches on the outside of the building, allowing all systems to be activated before entry.
- An electric garage door opener so the building can be opened with entry.
- A fire/smoke/security alarm with a dedicated line to the fire department or security company; and
- Exhaust fans and an emergency shower/eye wash station.

The use of a prefabricated structure should be given consideration when the installation of a new chemical storage facility is necessary. One of the advantages of a prefabricated structure is the different sizes available for the maintenance facility site. Prefabricated structures can range from 62 cubic feet to 2,300 cubic feet.

Other benefits include having all the necessary building, fire and electrical codes met. These structures also are compliant with environmental legislation.

Fertilizer storage facilities. Fertilizer storage areas are equally important, and many of the principles outlined above apply as well. An



An example of a chemical and fertilier storage/mix room area. This floorplan doesn't provide forklift access to the fertilizer storage area. Photo: McMahon Group